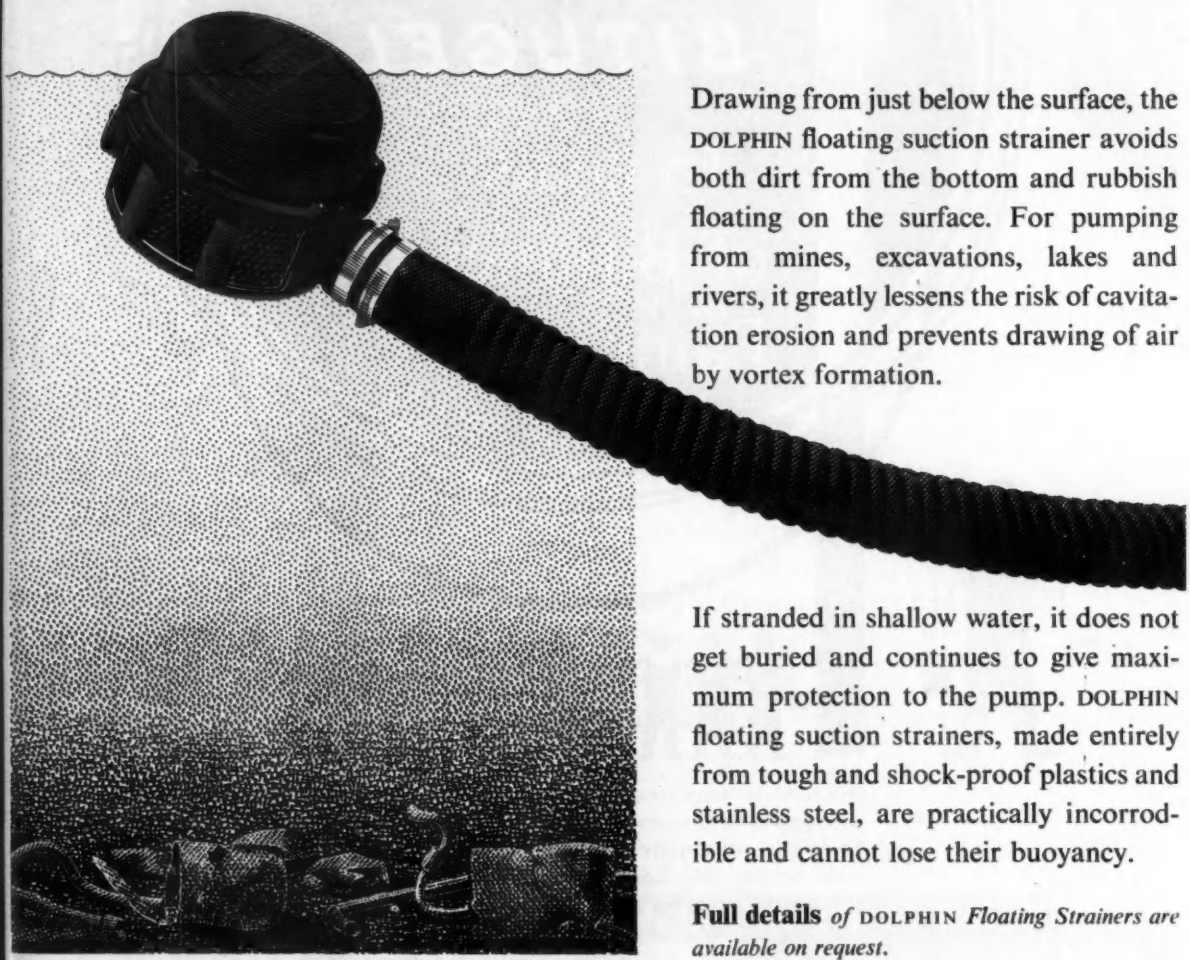
10 JUNE 1959

GAS IN INDUSTRY

Supplement to the "GAS JOURNAL"

Vol. 2 No. 14

This floats clear of pumping trouble



Drawing from just below the surface, the DOLPHIN floating suction strainer avoids both dirt from the bottom and rubbish floating on the surface. For pumping from mines, excavations, lakes and rivers, it greatly lessens the risk of cavitation erosion and prevents drawing of air by vortex formation.

If stranded in shallow water, it does not get buried and continues to give maximum protection to the pump. DOLPHIN floating suction strainers, made entirely from tough and shock-proof plastics and stainless steel, are practically incorrodible and cannot lose their buoyancy.

Full details *of* DOLPHIN *Floating Strainers are available on request.*

DOLPHIN FLOATING STRAINERS

Save their cost many times over

MEGATOR PUMPS & COMPRESSORS LTD · 43 BERKELEY SQUARE · LONDON · W1 Telephone: GROsvenor 6946

TGA M112

Cutting the cost of corrosion prevention

Bitugel is thixotropic—one coat is equal to 15 of ordinary bitumen paint
There is no embrittlement at low temperatures and no plastic flow from heat
Bitugel prevents rust creep from damaged areas

BITUGEL **HEAVY DUTY ANTI-CORROSIVE**

A PRODUCT OF EVODE OF STAFFORD

Manufacturers of EVOKOTE, EVODYNE and EVO-LED Paints

✳ **SEND FOR LITERATURE** EVODE LTD., (PAINTS DIVISION) STAFFORD. Telephone: 2241-5

London Office: 82 VICTORIA STREET, S.W.1. Telephone: ABBey 4622-3

H-W.104

"What are the advantages of METRIC Rotameters?"

"They have several important advantages:

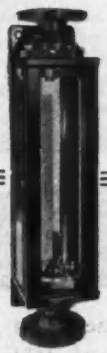
1. One instrument can be used to measure the flow rate of a number of different liquids or gases.
2. Replacement parts including tubes and floats are interchangeable.
3. The entire range is available immediately from stock.
4. The initial cost is low"

"How is this done?"

"By means of interchangeable floats in a range of standard size tubes having arbitrary scales convertible to any system of units."

"How can I learn more about them?"

"Write for leaflet GJ. 2020/18"

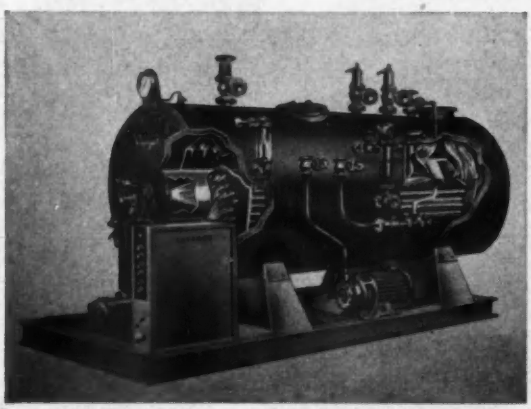


ROTAMETER

FLUID MEASUREMENT AND CONTROL
FLOW-DENSITY-LEVEL

ROTAMETER MANUFACTURING CO. LTD
330 PURLEY WAY, CROYDON, SURREY Telephone: CROydon 3816

KAYENCO GAS FIRED STEAM RAISING PLANT



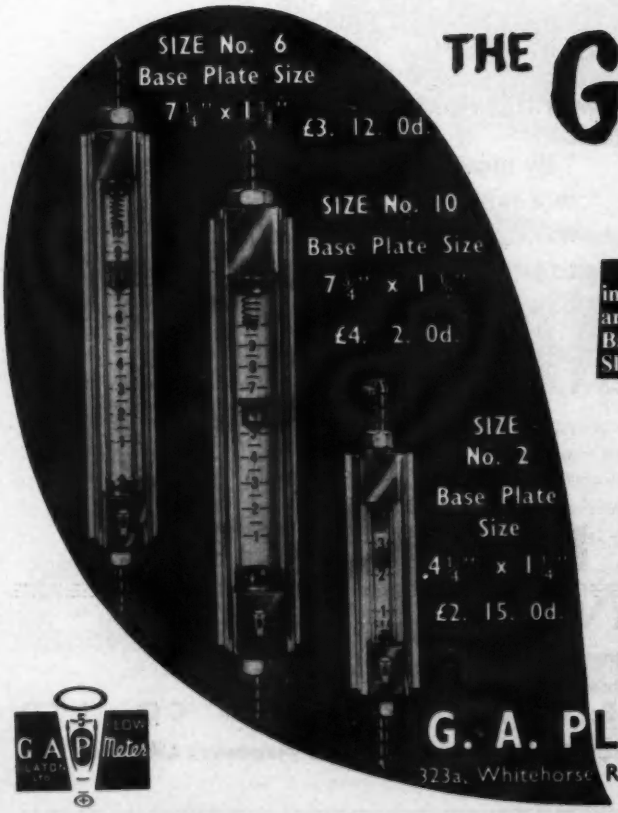
Typical KAYENCO two pass Class I packed boiler. Note. M.P.A. Burner with control cabinet, Twin Mobrey controls, Worthington Simpson feed pump. Corrugated furnace and substantial flanged mountings.

The latest Kayenco development is a range of shell type boilers with capacities from 1,000 to 10,000 lbs. of steam per hour using gas or oil firing. KAYENCO Boilers have been thoroughly tested and proved for economy and reliability and are constructed to A.O.T.C. requirements class I. Write for details of these new boilers and our engineers will be glad to advise you on any heating problems using gas or oil fuel and waste heat recovery.

KAYENCO BOILERS

FREDERICK KAY (ENGINEERING) LTD., Nashleigh Works, Chesham, Bucks. Telephone: Chesham 533. Northern Representative: Mr. T. Clark, 119 Kilpatrick Gardens, Clarkston, Glasgow. Tel: Giffnock 3372.

THE GAPMETERS



These are variable-area direct-reading flowmeters for liquids and gases. They are simple instruments: accurate, compact and inexpensive.

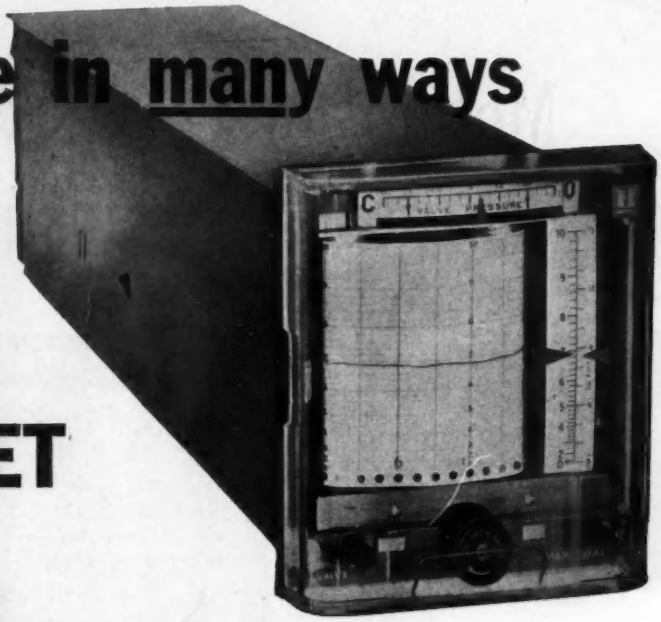
Gapmeters are adaptable and easy to install in either vertical or horizontal piping (at any angle). Interchangeable fittings allow Front or Back Panel pipe connections; also attachment to Slotted Angle Frames and Laboratory Scaffolding.

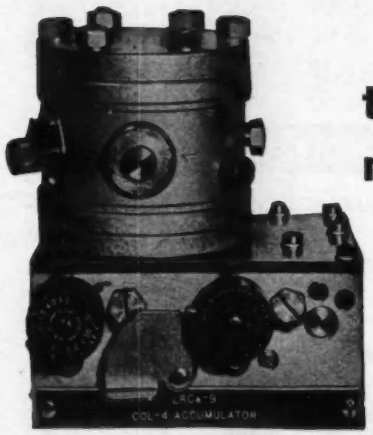
Gapmeters, made for ⅛", ¼" and ⅜" B.S.P. sizes (with Nozzle, Straight Union or Banjo fittings), fulfill the need for small, precision-made, flowmeters at low cost for use with Service Fluids, Fuels and Scavenging Fluids, Inert Gases and Cooling Fluids as well as general chemical and process operations.

Floats and other contact components are readily made in materials to suit all industrial fluids. All floats rotate. Bold scales are used, and each instrument is protected by a perspex cover.

G. A. PLATON LTD. *Makers of the Flostat*
323a, Whitehorse Road, Croydon, Surrey. THOrnton Heath 1631

you save in many ways with TEL-O-SET





Quick connect Tel-O-Set controller, for proportional control—with automatic reset—of any variable. Derivative action is easily added.

today's most advanced miniature pneumatic instruments

Record, indicate or control any process variable with versatile Tel-O-Set instruments. They're the most dependable, economical, and easily-serviced miniature instruments you can buy.

CUT INSTALLATION COSTS
- Startup is safeguarded by wiring and piping case separately . . . keep chassis safe in original carton until startup.
- Quick-connect design makes chassis mounting easy, fast, foolproof.

CUT SPARE PARTS INVENTORY
- Change recorder to indicator and vice versa . . . without changing case or disturbing field connections.
- One basic controller model for any variable— derivative action easily added.

REDUCE PROCESS DOWNTIME
- All working parts can be inspected during operation, without process interruption.
- Zero and span, the only recorder adjustments required, are set from front of panel.
- Quick connect switch on controllers permits removal of unit while process remains on manual control.

SAVE IN MAINTENANCE
- Separate pneumatic and electric connections—no need for electrician to stand by.
- Linearity built in at factory, requires no attention.
- Unitised construction of all components simplifies maintenance, makes re-assembly easy.

WRITE OR SEND THE COUPON TODAY for full information to: Honeywell Controls Ltd, Ruislip Road East, Greenford, Middlesex. WAXlow 2333

Please send me a copy of Bulletin 7202.

NAME .....

APPOINTMENT .....

ADDRESS .....

..... G!

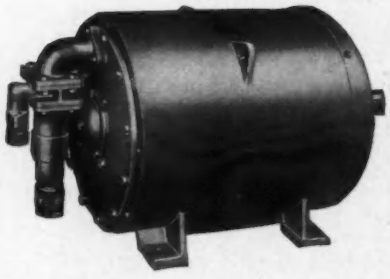
Sales engineering, initial and periodic service, available from 10 U.K. Branch Offices. Sales Offices in principal cities of the world.

Industrial Instrumentation Micro Switches
Heating & Air Conditioning Controls

Honeywell

First in Control

Motors for corrosive and explosive atmospheres



CHEMICALS, PAINT & GAS WORKS

Class 'LYC' motors to B.S. 2083 up to 25 h.p.
'ENGLISH ELECTRIC' is the only Company making chemical works motors to this standard. Tens of thousands of British Standard motors are in service. Available up to 50 h.p. in N.E.M.A. sizes.

Write for Publication DM/206

PETROLEUM

Class 'XLK' flameproof motors Squirrel-cage or Slipring. Totally-enclosed fan-cooled or Totally-enclosed. Complying with Oil Companies Materials Committee requirements. Buxton certified.

Write for Publication DM/154

COAL MINING

Class 'LP' steel-barrel, flameproof Squirrel-cage motors. Totally-enclosed fan-cooled available up to 150 h.p. Totally-enclosed available up to 50 h.p. Buxton certified for underground use.

Write for Publication DM/225

AVAILABLE FROM STOCK

'ENGLISH ELECTRIC'

industrial motors

THE ENGLISH ELECTRIC COMPANY LIMITED, MARCONI HOUSE, STRAND, LONDON, W.C.2.

Industrial Motor Works, Bradford

WORKS: STAFFORD · PRESTON · RUGBY · BRADFORD · LIVERPOOL · ACCRINGTON

DM74A

Latest in Enamelling

All other heating methods look archaic beside the new Incandescent L shaped Jetubes. Designed specifically for vitreous enamel fusing furnaces, this form of the Jetube has a large radiating surface and low thermal storage, giving fast and flexible heating. Installation costs are low, and the system is equally revolutionary in batch or continuous furnaces.

Jetubes are the recirculating radiant tubes made by Incandescent (British patents 729,470 and 754,542). There is a Jetube design for all furnace heating applications.

INCANDESCENT

THE INCANDESCENT HEAT CO. LTD. SMETHWICK . ENGLAND.

6/14/59

Automatic Safety in the PERL range

PERL have pioneered the development of many gas controls. Magnetic Gas Valves, Thermostats, Relay Valves, Roomstats, Flame Protection Sets, Automatic Igniters—all the products included in the wide PERL range are designed for consistent reliable service. When you are planning a system of automatic control or protection, you cannot do better than call in the experts. For all forms of flame protection or thermostatic control—*pass your problem to* PERL!

MAGNETIC GAS VALVES

The PERL range of safety controls includes magnetic gas valves (straight-through type) in sizes ¼"-1" B.S.P. The unique 2-way diaphragm type 60, is available from ¾" to 6" B.S.P. For standard and non-standard voltages—A.C. or D.C. Careful design and precision production ensure silent operation and, of course, consistent reliability.

PERL CONTROLS LIMITED

672 Fulham Road, London, S.W.6 Phone RENown 5555 & 5556
Works: 45 Gatwick Rd., Crawley, Sussex Phone Crawley 25115-6

GAS IN INDUSTRY

JUNE 1959
Vol. 3 No. 13

FEATURES

TILTING BOGIE HEARTH FURNACE CUTS MAINTENANCE COSTS

INDUSTRIAL GAS IN AN EAST ANGLIAN DIVISION.
By R. F. Saggers

TAP MAKERS USE 60,000 THERMS OF GAS A YEAR.
By Eric Ford

NEW £100,000 WORKS CANTEEN USES GAS

FILM STORAGE POSED PROBLEM FOR GAS BOARD

Published by
WALTER KING LTD
11, BOLT COURT FLEET STREET
LONDON, E.C.4.
Telephone: FLEet Street 2236-7
Telegrams Gasking, Fleet, London

Editorial

Service to the Industrialist

INDUSTRIAL centres are coming into being in increasing numbers as the industrial gas load develops. The last to be opened is at Derby to serve the East Midlands area. Old established centres, all of which were set up before nationalisation, are at Birmingham, Manchester and Liverpool, as well as the industrial department at Watson House. Those established recently are at Bristol and Poole, while, if the industrial load in East Anglia continues to increase, the move of the Eastern Gas Board's headquarters to Watford may well mean an industrial centre being set up there to back the Board's activities in both its urban and rural divisions. Its big rise in the industrial load is seen by the steep increase in the Ipswich Division to nearly 20% of all gas sold, compared with 30% in the more industrial divisions of this board. In the more traditional industrial areas of the West Midlands and East Midlands Boards, this figure is about 51% and 48% respectively. This high percentage of non-domestic gas consumption puts a heavy responsibility on the boards to maintain good contact with the local industrialist and to inspire confidence in the use of gas.

What is the function of these centres? What particular contribution do they make towards the selling of gas to industry? They are not research centres. The main research centres of this particular section of the industry are at Watson House and the industrial laboratory at Leeds, at both of which highly qualified, academically-trained scientists are employed. At the industrial centres, however, are to be found full scale industrial appliances typical of those likely to be found in some nearby industrial area. Those employed at the centre will be fully qualified engineers, experienced in the design of large scale gas-fired equipment, who will be able to advise on the conversion of existing equipment and to demonstrate the advantages to be gained from its use on the plant at the centre. Thus, an industrialist who may be uncertain as to whether the claims made by the gas industry justify him buying a particular type of furnace, may be convinced if allowed the use of the equipment at the centre, run under conditions identical with his factory. He will in this way be able to carry out a full-scale trial before committing himself to heavy capital expenditure of perhaps £50,000.

The staff at the centre may be compared to the army's general staff, which must be available to the army commander and have all the answers ready at short notice. The industrial gas officer in the course of his duties may realise that gas is applicable to some industrial process, but needs confirmation to convince both himself of the best methods to be employed and the industrialist of the feasability of changing to gas. Such information the industrial centre can supply.

Tilting bogie hearth furnace reduces maintenance costs

LANGLEY ALLOYS LTD., are the well-known manufacturers of the Langalloy and Hidurax range of alloys. Gas is used extensively in the foundry for shell moulding, core drying, ladle drying and other specialised foundry requirements as well as for canteen and welfare purposes.

The North Thames Gas Board's industrial department was asked to give consideration to the replacement of an electric furnace which operated at up to 1,250°C. with a stated input of 80 kW. This request was a direct result of the high maintenance and replacement costs which were being incurred with the equipment.

The hearth of the furnace was subjected to hard wear and tear through heavy parts being dropped on to it during loading. It was suggested that a bogie hearth furnace with measurements 4 ft. long by 3 ft. wide might be more suitable. It would be necessary for the bogie hearth to tilt when withdrawn so that the articles could be easily tipped into a side quenching tank. The furnace should be capable of attaining a temperature of 1,250°C. with a variation of ±10°C.

A loading platform in the shape of a steel table at the same height as the bogie hearth together with a quenching tank sunk into the floor, would complete the arrangement.

Bogie Construction.—The articles to be heated are laid on the bogie which has a high quality firebrick top backed with insulating refractory. The door, which forms the back of the bogie is lined with lightweight insulating refractory and diatomaceous material.

Clamping screws with hand wheels are provided on the door to lock the bogie in position. An important advantage of having the door built onto the bogie is that the operator is shielded against radiation from the articles on the bogie as it is withdrawn. Withdrawal is executed manually through a chain and bevel gear drive to the wheels, the operating handle being situated at a convenient height on the back of the door. A sufficient length of rail is provided for withdrawing the bogie clear of the mouth of the furnace for loading and unloading.

It is estimated that to heat the furnace and a 500 lb. charge to 1,250°C. would take three hours and require approximately 5,100 cu.ft. of gas. For a follow-on charge of 500 lb. assuming the furnace to be at 1,150°C. and the bogie at 1,000°C. would take one hour with a gas consumption of 2,300 cu.ft.

These figures are based on a calorific value for the gas of 500 B.t.u. per cu.ft.

Tests were subsequently made during a day's operation to determine the performance of the furnace under normal operating conditions. The working temperature of 1,050°C. was obtained in 1¼ hours after lighting from cold for gas consumption of approximately 2,500 cu.ft.

For one of the charges of 291 lb. of small castings of a nickel based stainless steel the working temperature was recovered in 20 minutes for a consumption of 500 cu.ft. of gas. A further 800 cu.ft. were consumed while one hour's soaking was taking place; making a total of 1,300 cu.ft. for the treatment of the charge.

I.G.D.C. TOUR GLASS MAKING FACTORY

A VISIT to the St. Helens, Lancashire, works of Pilkington Brothers Ltd., glass makers, was a feature of the meeting of the Industrial Gas Development Committee to Liverpool recently. It was the first time the Committee had met in the Liverpool area for 13 years.

Several members of the committee visited the Development Centre to inspect the work at present being undertaken. The committee met at the Bootle Service Centre, and was later invited to attend a dinner by the North Western Gas Board.

Principal guests at the dinner were Mr. H. Butters, representing the Chairman, Mr. D. P. Welman; Mr. R. F. Hayman, Industrial Gas Officer to the Gas Council, and Chairman of the Committee; Mr. J. B. Watt, Technical Director, Pilkington Brothers Ltd.; Mr. J. Castle, General Manager, Liverpool and Wirral groups; Mr. R. L. Greaves, General Manager, South Lancashire group; Mr. F. Litler, Technical and Planning Officer, N.W.G.B.; Mr. W. L. Howe, Liverpool group Industrial and Development Centre Engineer; and Mr. W. F. S. Howell, Manchester group Industrial and Development Centre Engineer.

Industrial gas in an East Anglian division

—Part II

From a paper by

R. F. SAGGERS,

M.Inst.Gas E.,

DIVISIONAL INDUSTRIAL GAS ENGINEER, IPSWICH DIVISION EASTERN GAS BOARD,

to the Eastern Junior Gas Association at Ipswich.

GEORGE COURTAULD was a Huguenot whose parents came here in 1686. He erected silk mills at Braintree and Pebmarsh, and his son Samuel set up another silk factory in 1816 at Bocking, from which has grown the world renowned firm of Courtaulds Ltd. At the end of the 19th century this firm was manufacturing crêpe-de-chine and chiffon, and had four factories in Essex, one in Lancashire and headquarters in London. In 1904 they developed viscose rayon and began production in a new factory at Coventry. Over the years they have developed other man made fibres including nylon, and in the U.K. now employ over 20,000 people in 24 factories.

At the original factories at Halstead, Earls Colne, Braintree and Bocking the gas consumption has been moderate for many years. There are several items described elsewhere. A recent addition is a singeing machine which employs premixed gas and air delivered under pressure to two strip burners the width of the cloth. The resultant high intensity flame is short and of uniform length. The cloth passes between the two burners at high speed and is singed on both sides creating a smooth finish. The gas consumption of this machine is 1,200 cu.ft. per hour.

Increased consumption

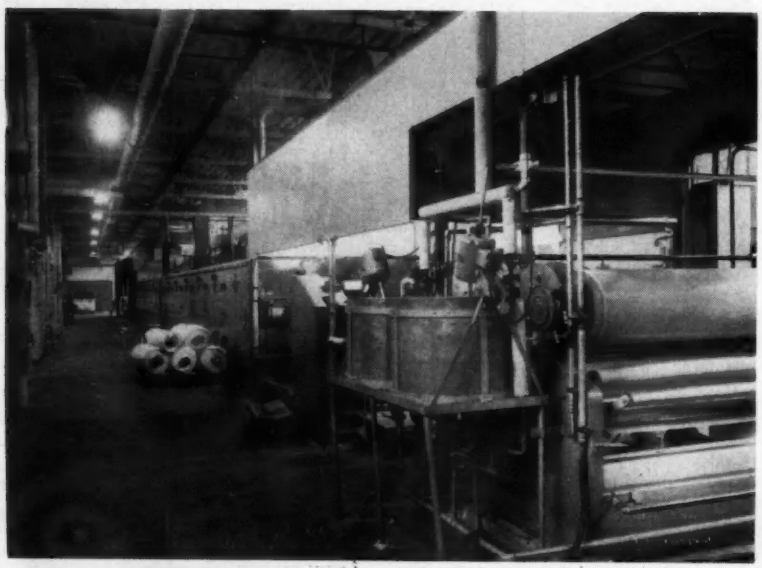
At Bocking a new stenter 116 ft. long has recently been installed whose purpose is to set the woven cloth into its final dimensions by the application of heat. The cloth is fed in at one end at speeds ranging up to a maximum of 60 yards per minute, and in widths up to 72 in. It passes through eight individually controlled heating chambers each 10 ft. long, the first four being steam coil heated at up to 160°F. The last four chambers are maintained at any selected temperature between 160/425°F. by 3-in. steel tubes heated internally by gas flames, each tube employing a neat flame Selas 122/3 burner rated at 125 cu.ft. per hour. Each chamber has 12 tubes grouped to a modulating valve controlled pneumatically by a temperature recorder. Any combination of temperatures required by a particular material can be achieved at less than plus or minus 1°F. accuracy. The stenter has a maximum gas rate of 6,000 cu.ft. per hour, and has increased the consumption of the Bocking factory to 80,000 therms a year.

Because of their climate and soil conditions, Suffolk and Essex are among our most important grain growing counties. Last year Suffolk cultivated 380,000 acres of barley, wheat and sugar beet, and the acreage in Essex was on a similar scale. Suffolk is also an important producer of milk and livestock, maintaining a current population of 126,000 head of cattle, 248,000 pigs, 93,000 sheep, and 2¾ mill. poultry. The clover, grasses and other crops necessary to feed these are grown on a further quarter of a million acres. Both counties have for centuries produced a great deal of food for London and the home counties, and in doing so have played an important part in the economic life of this country. At their large modern factory in Ipswich Harris Ltd., slaughter 3,000 pigs a week and turn them into a variety of food products including skinless sausages. The British Sugar Corporation have two large factories at Ipswich and Bury St. Edmunds, the latter using gas in the laboratories.

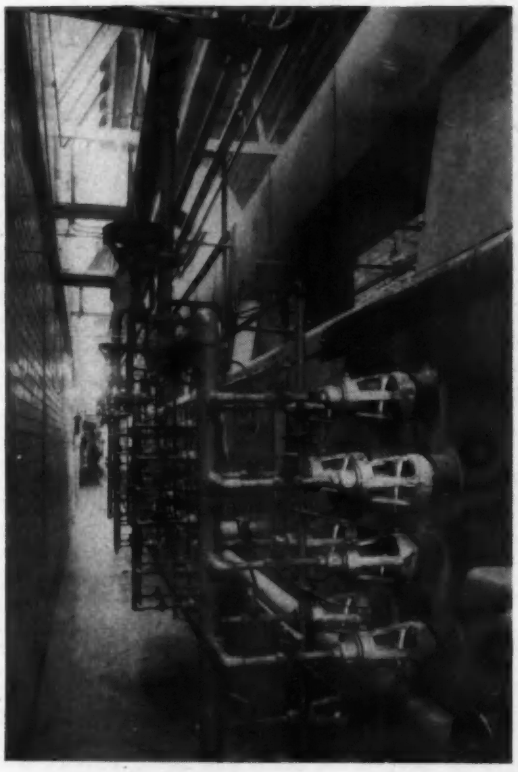
Ideal fuel

East Anglia produces large quantities of grain and also imports similar quantities from Europe through the docks at Ipswich, Felixstowe, Colchester and Maldon. Much of this is used by breweries and for livestock feed, the remainder going to the many large flour mills in the area. There is little scope for gas in flour milling, but for the subsequent process of bread baking it is an ideal fuel. In the Ipswich division there are 49 bread baking establishments using gas fired ovens, and as far as is known, very few electric or oil fired. The majority are multi-deck, while there are several travelling ovens ranging from one sack to six sacks per hour. Three of the travelling ovens have fuel consumptions between 1.9-2.3 therms per sack.

As a point of interest, Newstead's Bakery in Ipswich use gas fired ovens and have taken first prize in countless open bread competitions



View from the feed end of a stenter installed at Courtaulds Ltd., Bocking.

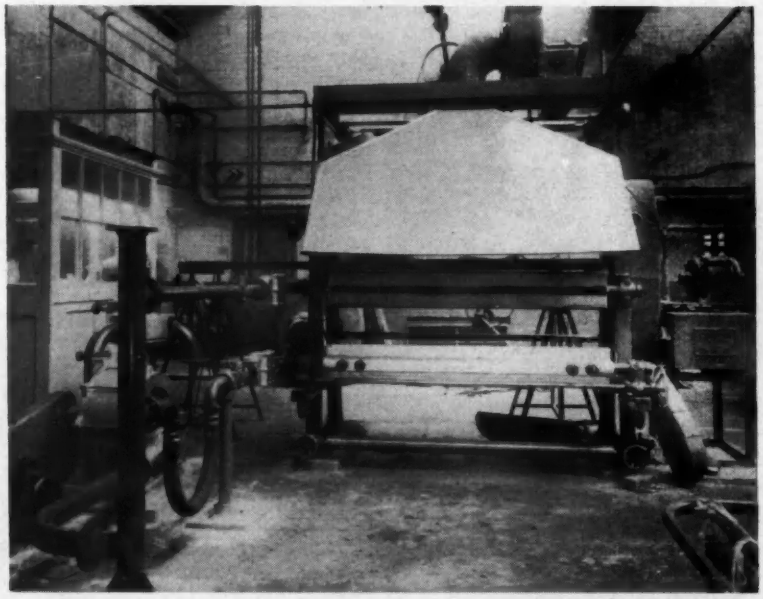


★

Left: *The gas-heated section of the stenter at Courtaulds Ltd., showing the Selas neat burners and immersion tubes.*

Below: *Gas-heated singeing machine in course of erection at Courtaulds Ltd. The machine for premixing gas and air is on the left.*

★



held by master baker's associations all over England.

Table 4 shows the gas consumed during 1957-58 under the bread baking tariff for each division of the Eastern Gas Board. It indicates that Ipswich division compares favourably.

The Melford Malt Company recently asked us to convert four rotary malt roasters from producer gas. Their motives were to reduce their costs of fuel, labour and plant repairs, to attain better control of heat input, and to avoid the installation of expensive effluent treatment which the local authority would require now that piped sewage was being installed in the village for the first time.

The roasters are 53 in. long and consist of two horizontal concentric drums 53 in. and 60 in. diameter sealed by end plates. The outer drum is thermally insulated. In the inner drum is a horizontal centre tube having cross tubes discharging into the annulus. The annulus is sealed by one end plate, but open at the other end where it is used as a firing slot at the bottom, and a flue at the top. The roaster rotates at 20 r.p.m. and four stationary producer gas burners fired into the slot at the bottom, hot gases passing both around the annulus and through the cross tubes discharging at the top to atmosphere.

More flexibility

An estimate of the required town gas rate was made by metering a producer burner in action and crediting the plant with a calorific value of 140 B.t.u. per cu.ft. We had been advised that high pressure or air blast burners were usually employed on such machines, but our customer wished to avoid installing compressors or air blowers. Because of this, and the dusty atmosphere, we experimented with a simple neat burner, which would provide more flexibility than an aerated type. This burner consists of a 2 ft. 6 in. length of 1¼ in. M.S. pipe curved to suit the firing slot and fitted 1 in. away in the same place as for producer gas. There are 40 ports each at three-quarter-inch centres, and the resultant flame is about 12 in. long.

During initial tests on the first roaster the pressure was varied to produce gas rates between 700/950 cu.ft. per hour so as to determine the most suitable input consistent with time and quality of product. There was little difference in fuel consumption between one hour 50 minutes and three hours, but the shorter times caused blistering of crystal malt, and times over two-and-a-half hours would have reduced the daily tonnage over the same labour time as for producer gas. All the roasters have now been converted.

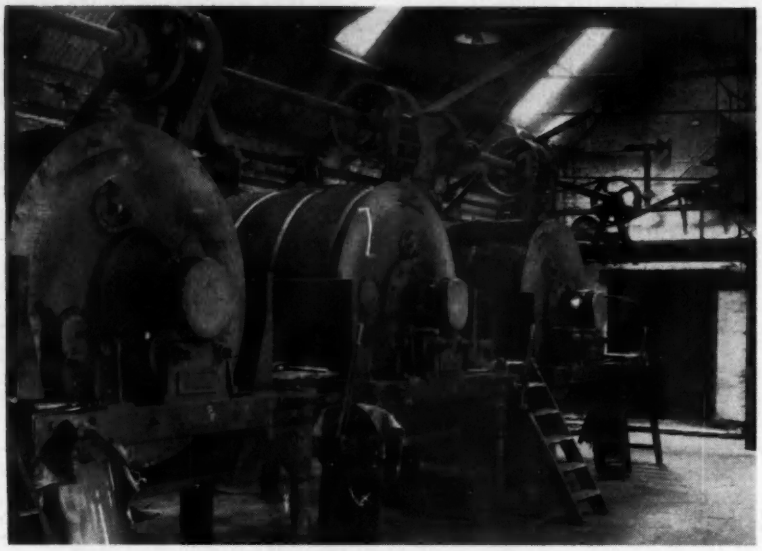
The drums are warmed for ten minutes prior to the first load at 7.30 a.m. Each roaster is charged with

TABLE 4

	Tottenham	Watford	Cambridge	Ipswich	Norwich
No. of bread baking establishments..	60	67	38	49	23
Therms charged under bread baking tariff	419,545	439,645	221,563	373,003	244,619
Therms per domestic consumer ..	1·8	2·32	2·27	3·12	2·70
Therms per head of total population..	0·51	0·575	0·39	0·56	0·36
Percentage of total load	0·95%	1·2%	1·14%	1·82%	1·97%

five to six bags through a hole in the top, and is sealed and rotated. The burners operate at full rate throughout the roasting of crystal malt, but for roasted barley the operator takes frequent samples and adjusts the gas rate according to their condition. Each roaster normally has four loads a day, the first taking two-and-a-half to two-and-three-quarter hours including prewarming and subsequent loads being roasted in two to two-and-a-quarter hours. A day's run of 16 loads uses approximately 28,000 cu.ft., equivalent to 1.0 therm per cwt. initial load. The annual consumption should be 35,000 therms compared with 230-250 tons of anthracite at £13 17s. per ton. This not only represents a financial saving for the firm, but contributes towards coal conservation.

Between Colchester and Chelmsford lie many thousands of acres devoted to the growing of seeds, fruit bushes and fruit trees for sale to farmers all over the U.K. and overseas. A number of well known seed suppliers in this zone operate on a large scale, and one of them uses gas in the laboratories and for seed drying.



Three of the rotary malt roasters converted from producer gas to town gas at the works of the Melford Malt Company.

Hypact burner

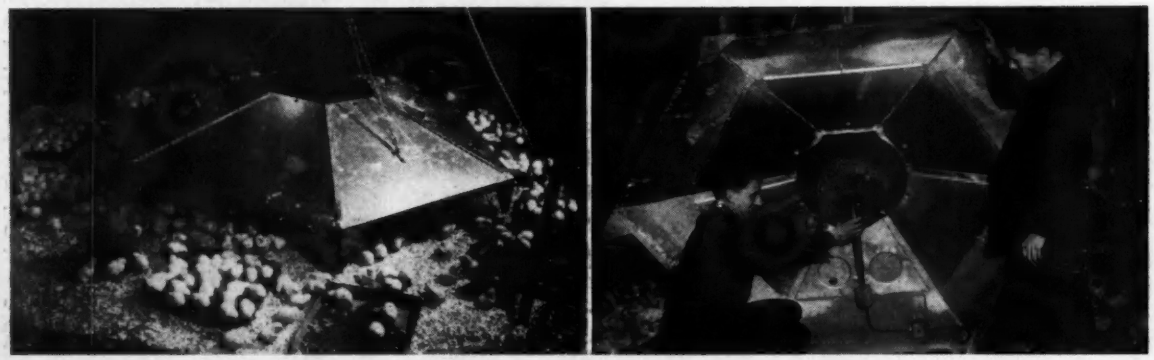
Carefully selected seeds grown by local farmers supervised by the firm's technical staff are brought to the drying room on the top floor of the building, where up to two tons of seeds at a time are spread out in a thick layer over a hessian covered perforated floor 30 ft. long by 15 ft. wide. Warm air from a direct fired gas heater employing a Hypact burner at 3,000 cu.ft. per hour, is pulled by a hot gas fan through an insulated duct to a distributing box fitted to the underside of the floor. The air passes upwards through the seeds and out through the windows to external atmosphere. An Aric thermostat fitted in the duct operates a magnetic valve in the gas supply and provides accurate temperature control. The lighting up sequence is controlled by an Elcontrol F.S.5 electronic device which provides an initial air purge of three minutes followed by spark ignition of a pilot burner. A flame electrode inserted through the pilot flame provides flame failure control of both pilot and main burners. Fitted in the duct is an air flow switch which shuts down the heater in the event of fan failure, and a further electrical thermostat overrides all other controls in the event of overheat which could damage the seeds. A klaxon horn gives audible warning of shut down due to any cause, this being necessary because the plant is unattended other than starting and stopping.

Drying is normally completed in one to two hours, the seeds being then discharged through holes in the floor to the cleaning, dressing and bagging equipment.

This is an example of the particular suitability of gas equipment for critical low temperature operations, and of a location on the fourth floor of a modern building, where the application of most other fuels would be difficult.

Poultry industry

The rapid increase of world population requires equal development of food resources, and the poultry industry is making a great contribution to this effort by improving methods of egg and meat production. It has been said that the price of chicken will soon be consistently lower than that of red meat, and in U.S.A. prices are quoted of 45 cents for a 3 lb. chicken compared with beef at 1½ to 2 dollars per lb. The current consumption in U.S.A. is 31 million birds a week, and rising rapidly. In U.K. the current consumption is 45 million birds a year with a forecast of 250 million in 1965, provided that the hatcheries can keep



Left: *Day-old chicks enjoying the benevolence of a 1000-capacity brooder. On the* **right** *some older birds are disturbed while the equipment is examined.*

pace, and that the housewife can be persuaded that chicken is no longer a luxury.

For broiler production a special breed of cockerel has been developed which gains weight rapidly between birth and ten to 12 weeks. At this age it weighs 3½ to 4½ lb., and is killed, because the rate of weight increase falls off and feeding becomes uneconomical. These birds are not allowed to run free in fields, but are kept in specially constructed huts under controlled conditions of temperature, light, and ventilation.

Radiant heating

Many methods of heating chicken houses have been used, including under-floor hot water pipes, natural or forced convection, and radiant heating, the last named being now considered as the most effective. Underfloor heating provides a warm floor but cannot maintain the necessary air temperature economically because of the insulating effect of the sawdust layer. Convection methods are not economical because in order to maintain the comparatively high temperatures at floor level it is also necessary to heat the whole hut to the same standard. Radiant heating providing the desired local temperatures at floor level without heating the whole hut, has been proved to reduce the mortality rate to less than 1½%, and weight gains 20% greater than with other methods have been recorded.

Electrical methods of radiant heating have been successfully used, but the voltage drops and power failures which occur in country districts make electricity unreliable. Radiant heaters are available which can be heated by L.P. gases, paraffin, or town gas, and the most common unit is capable of looking after 1,000 birds. This unit is variously called a brooder, Hover, or foster mother, and employs a simple drilled ring burner rated at 16,000 B.t.u. per hour. The burner heats a circular fret made of heat resisting metal to red heat, which is radiated downwards by an 84 in. insulated metal canopy. The air sleeve is protected from food, feathers and sawdust by a gauze filter. The products of combustion pass through holes in the canopy and around its underside, and are used to maintain a constant air temperature of 60 to 65°F. within the house, which is so sized and constructed as to make this possible. Control of the air temperature is achieved by a capsule type of thermostat fitted under the canopy. The temperature immediately underneath the brooder is of the order of 90 to 95°F. when fitted at floor level as for very young chicks. At this stage they are confined to the immediate area under the brooder by barriers which also prevent floor draughts which would be fatal. As the chicks grow and require less local heat and more space, these barriers are removed, and the brooder is progressively raised by pulley, until the chicks are four to five weeks old. At this stage the birds are quite hardy, and produce enough body heat to maintain the desired air temperature, without requiring artificial heating. Ventilation then becomes very necessary for several obvious reasons. At ten to 12 weeks the birds should reach killing weight, the hut is cleared and cleaned, and a new batch of dayolds is brought in after two weeks have elapsed.

Gas might be required for emergency lighting because in the event of failure of lighting, normally electric, the birds would panic if plunged into utter darkness. They bunch together or run all over the hut in a mass, and the weaker ones could suffocate or be crushed to death. A farmer near here recently lost 500 chickens during a short power failure caused by a swan flying into overhead cables. A small light with a red globe is often specified, because chickens will feather peck if subjected to bright artificial light for long periods. These might occur if the farmer used his gas lighting for supplementary space heating during very cold weather, as has been known. The gas lights can be switched on automatically by a reverse acting solenoid valve arranged to open by failure of electricity.

Town gas is reliable in quality and supply and compares favourably in price for this process. The average consumption per bird varies according to the weather, but over the year would be of the order of 10 to 15 cu.ft. which is a very small cost in relation to the retail value. The farmer usually contracts to kill a specified number of birds at regular intervals, and because of this would have several houses with birds at different stages of growth. Each brooder represents a potential consumption of 250 to 300 therms a year, and the load at a large farm could be substantial and regarded as fairly constant over 24 hours a day. One of our farmers has five huts containing 35,000 birds, and is planning to increase the population to 65,000. This represents 65 brooders, a potential load of over 15,000 therms and a turnover of 260,000 birds a year.

This type of business has only come to Ipswich division within recent months, but we already have six farms connected.

We have a very good customer in Moler Products Ltd., of Colchester, whose principal reasons for being there might be said to be geographical. They manufacture insulating bricks and powders. The majority of their raw materials exist only in Denmark, and a glance at the map of the North Sea will show that East Anglia provides the shortest sea routes to that country and therefore the lowest transport costs.

Their large works at the riverside opposite the gasworks specialises in the manufacture of diatomaceous earth bricks for medium temperature insulation, and insulating refractory bricks for use at higher temperatures. Five different grades are produced, both in standard brick sizes and in special shapes to customers' requirements. The two Fosalsil types—Solid grade and Economite—are serviceable up to 870°C., while the insulating refractory group—M.P.25, M.P.23, and M.P.21—are suitable up to temperature limits of 1370°C., 1260°C., and 1150°C, respectively. In addition a variety of insulating aggregates and powders is also made.

The factory has previously been described in the technical press,[7] and little remains to be said except that there are now three continuous Bricesco kilns instead of two. These operate at constant rate every day, week ends and bank holidays, and for this reason we regard Moler Products Ltd., as one of our best customers. The annual consumption is over 400,000 therms and is a most welcome base load for the Colchester gasworks.

Interesting factories

We have many other industrial customers whose processes could well be carried on in other parts of the country. In most cases there is no particular geographical or historical reason for their being in East Anglia. Crompton Parkinson Ltd., Marconi's Wireless Telegraph Co., Ltd., and English Electric Valve Co., Ltd., all making electrical or electronic equipment at Chelmsford, are known both nationally and internationally. Between them they use over 300,000 therms annually. There are more than 20 ferrous and non ferrous foundry installations in the division. At Braintree three firms specialise in manufacturing components and accessories for the motor car industry. At Stowmarket, Imperial Chemical Industries Ltd. make Dulux and Dulite paints in a large factory, in which capital construction of over £1½ mill. is now in progress. There are many other similarly interesting factories.

It would be too much to attempt to describe all these, but one or two are worthy of mention, as being of long standing in East Anglia.

(To be concluded)

Makers of water taps use 60,000 therms a year

By ERIC FORD

NO doubt some enterprising statistician could calculate how many times in the course of a week, month or year the average person turns a tap and obtains water, hot or cold, for the multiplicity of purposes demanded in modern life. It would then be possible to carry this a stage further and discover how very rarely water fails to flow from a tap due to any mechanical fault in it.

This reflects great credit on the manufacturers of water taps and ancillary fittings, one of the best-known of which is the Barking Brassware Co. Ltd., River Road, Barking, Essex, manufacturers of high quality fittings for the trade. At several points in their production process, gas plays an important part, the firm's annual consumption being in the neighbourhood of 60,000 therms a year.

This operator is soldering handspray tubes for bathmixers, using a rotary jig and an air-gas torch.

Innovation

At a well-appointed factory, occupying a 96,000 sq. ft. site and employing a labour force of about 250, the Barking Brassware Co., Ltd., manufacture water taps, waste fittings, showers and other related items. The company is particularly well known for the Biflo sink fitting in which hot and cold water is mixed only at the point of discharge from nozzle to the temperature required by the user. Another innovation introduced by the Company, which is now becoming general throughout the trade, is the use of red and green discs to indicate hot and cold water taps respectively.

Established shortly before the second world war (in fact, the company recently celebrated its twenty-first 'birthday') the Barking Brassware Co. Ltd. has succeeded in combining the streamlined artistry of the modern age with the sound craftsmanship of British industry. This has been recognised by the fact that one of the company's products, a bibcock tap, gained one of the Design of the Year awards of 1957 from the Council of Industrial Design.

This product was described as 'a well thought out solution of an everyday problem . . . offering an unusually pleasing appearance combined with real efficiency.'

Many other company products have been accepted by the Design Centre and are on show there.

From these achievements, it is clear that a great deal of careful thought must go into the design of water fittings, particularly as the relevant British Standards must also be considered. New and improved designs, throughout the wide range of fittings produced by the company, are continually being developed by the company's design staff, under the direction of the Managing Director, Mr. W. Petzall, who takes a particular interest in this aspect of the firm's operations.

Craftsmanship

From the designs in the drawing office, an accurate wood pattern is made in the pattern shop, where everything gives an impression of skilled British craftsmanship at its best. A brass master pattern is next made from which a plaster die of great accuracy is prepared. All subsequent operations depend on the accuracy of this die from which a sand mould is formed into which the die block is cast.

After subsequent machining, these die blocks produce what may be termed the 'body' of the tap, the internal waterways being provided for by the insertion of a suitably designed core or cores, of a material which can later be removed.

Gas-firing

At the works of the Barking Brassware Co. Ltd., cores from a moist resinous sand are formed by blowing the mixture into a mould or core box. It is necessary for cores to be dried and cured before being used in the foundry and gas-firing is used for this purpose.

Core drying was originally carried out in a recirculating gas-fired batch oven at Barking which gave every satisfaction in terms of quality of product but, due to the necessity for employing numerous trays and wheeled trucks, the equipment required a great deal of valuable workshop space. Furthermore, the necessity to load and

unload the trucks and to insert them into and remove them from the oven was costly in labour power. With expanding production a bottleneck could easily occur at this important point in the production line.

Accordingly, the services of North Thames Gas Board engineers were enlisted with a view to evolving a suitable continuous drying process on conveyor line principles and tests at the Board's industrial workshops at Watson House showed that sand cores could be effectively dried and cured in less than ten minutes, using high-temperature radiant heat panels.

On the basis of these experiments, a radiant heat conveyor drying furnace was designed, manufactured and thoroughly tested at the Board's workshops and later installed at the Barking factory, where it is now employed on drying approximately 3,500 core pieces per nine-hour day.

Supported on an angle iron stand, the oven is fired by 21 pairs of industrial Mastertherm heaters, firing downwards into a refractory-lined working chamber, through which the conveyor runs.

Accurate

This conveyor comprises a woven wire belt of 11 gauge wire capable of withstanding temperatures up to 600°C. Length between the shaft centres is 19 ft. 3½ in. and the overall width of the belt is 15 in. The equipment is fitted with an electrically-powered variable speed drive of 9 ft. to 33 ft. per minute.

Cores in the core trays ready for drying reach the furnace by roller conveyor on stout metal trays and feed on to the furnace conveyor belt. The accurate running of the furnace conveyor belt at this point is ensured by guides which effectively prevent the belt from 'wandering.' This end of the oven is also fitted with two ¾-in. bar burners, set up just prior to the tunnel mouth, to form a pre-heat zone under the approaching trays.

As would be expected, the greatest heat is necessary at the entry end of the oven, the necessary temperatures throughout the length being ensured by adjusting the number of heating panels in service.

This equipment has now been in operation long enough for its advantages to be clearly felt, and the company expresses itself highly satisfied with the furnace, which has doubled the potential output capacity, reduced labour costs by one-sixth and cut gas consumption by one-third, besides creating all the well-known organisational advantages of a flow process as opposed to a batch operation. Cores are now dried and cured in the course of an approximately seven-minute journey through the furnace, as compared with 45 minutes by the former batch method.

Leaving the oven, the cores are air-cooled and removed from the core trays when, after removal of the 'fraze,' they are ready for the die casting operation. Here the cores meet up with the die into which molten metal is poured to produce the cast tap body.

Brass for the manufacture of taps and other fittings is bought in as ingots and melted in suitable quantities.

An operator ladles the molten metal direct from the furnace, using the gravity die casting method, a technique in the application of which the Barking Brassware Co. Ltd., is a leading exponent. One die can be continuously used for about 5,000 'pours.'

By the time the casting leaves the die it can already be recognised as a tap body even by the layman, despite the fact that various excrescences, such as the 'feeder' (where the metal runs into the die) and joint 'flashings' have still to be removed by a grinding operation.

Prototypes

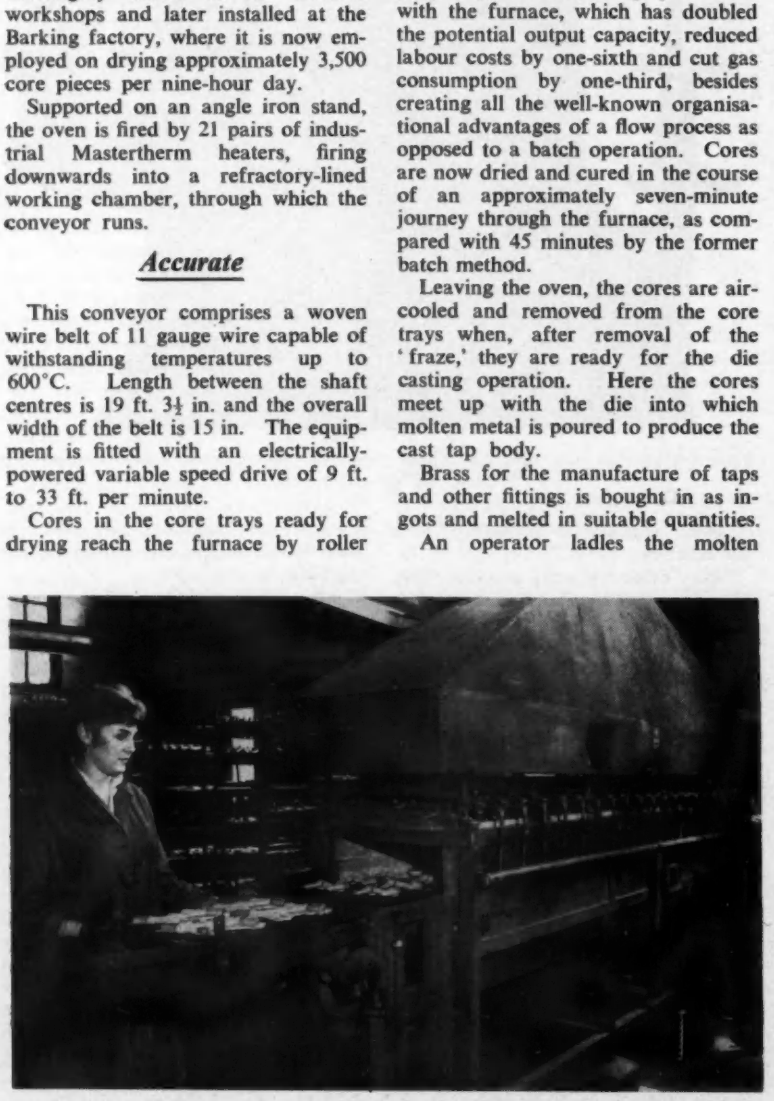
Various processes are now carried out in the machine shop where gas-fired equipment includes a blowpipe forge and a high-speed tool furnace, fitted with pre-heat chamber. In addition to obvious uses in various machining operations, this equipment is being increasingly used in the important development work now in progress in this section, including the production of prototypes of water taps for railway, aircraft and specialist applications.

After machining, the tap body is air-pressure tested under water and then polished, first on an abrasive band, to remove the rough casting surface and later by a polishing 'bob' and abrasive. In this latter process, the mop has to be first coated in glue and then dipped in a trough containing the abrasive. The glue is heated by gas which also heats the oven in which the mops are dried off. Subsequently, the final lustre is obtained by 'mopping,' using a polishing compound.

Experiment

Here it may be appropriate to refer to an interesting experiment conducted by North Thames Gas Board engineers into the possibility of recovering the waste metal removed by the mops. In the normal way, polish moppings are extracted at each machine by air suction, the resultant waste material comprising at least 10% by weight of waste metal. One proposal was to use a reverbatory furnace, but this scheme was rejected on the grounds that an air blast burner might distribute objectionable smuts into the atmosphere.

Nevertheless, a series of tests was carried out at Watson House but the amount of metal recovered did not appear to justify the adoption of the system. Although the proposal was abandoned, however, the experiments illustrate both the thought that the Barking Brassware Co. Ltd. give to the most economical operation of its business and the attention the Gas Board



Cores of moist resinous sand are used in the manufacture of watertaps. The cores are dried and cured in this radiant heat conveyor core drying oven which plays an important part in the production process at the plant of Barking Brassware Ltd. Cores are here seen entering the oven, which was designed, manufactured and installed by North Thames Gas Board engineers.

gives to its customers' requirements.

By the time the taps leave the polishing department, their gleaming brass looks attractive enough for them to be fitted for domestic use as they are. In fact, of course, they still have to be chromium plated and a surprising number of operations still remain to be carried out. The first of these is a de-greasing process to remove the residue of the polish before plating.

De-greasing is effected in trichlorethylene, contained in a large tank, which was fitted with burner equipment and insulation by North Thames Gas Board engineers. Heating is by two No. 60 Hypact burners, controlled by a single thermostat above liquid level, the tank being insulated from the base up to the underside of the water cooled section. The thermostat is actuated by the vapours given off by the trichlorethylene, which has a boiling point of 87°C. The vapours condense on the cold inner surfaces of the water cooled section of the tank and drip back into it. The insulated casing completely surrounds the liquid to be heated, thus reducing heat losses to a minimum.

Water fittings for the world! Well-known at home and overseas, Barking Brassware taps and other fittings are carefully packed in this spacious and well-lit bay for despatch to builders' merchants everywhere. Gas is used here too; note the overhead heaters.

Preparatory

From the de-greaser, the components are inspected and placed on suitable jigs for the plating and ancillary processes, which require a considerable number of operations, including cold electrolytic cleaning, to remove acids from the surface, a cyanide dip to remove stains, a sulphuric acid dip to etch the surface preparatory to the first plating operations, which are the deposition of copper and then bright nickel. This is in the nature of a preparatory operation since it provides a base on which to deposit chromium, this being necessary with brass.

In between these operations are interspersed a number of other dips, including cold water washes, caustic hot water baths and soda rinses for cleaning purposes.

Gas heating is employed for the hot swill tanks which were originally open-top galvanised tanks fitted with bar burners beneath and were somewhat wasteful of both water and gas. Accordingly, new tanks were designed by North Thames Gas Board engineers with a combustion chamber and flue ways completely surrounding all sides of the tank. An outer casing was made of 1-in. thick Marinite insulating board.

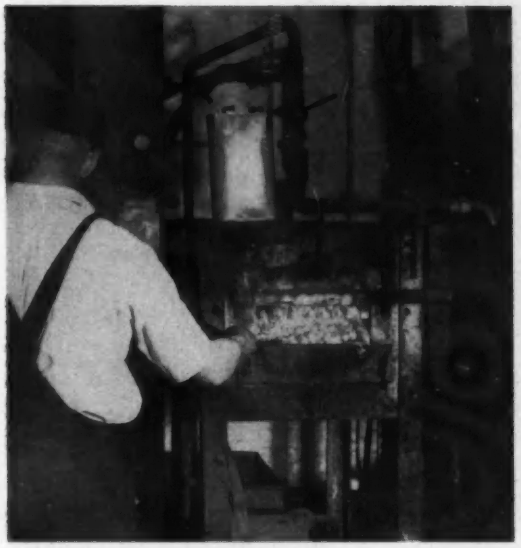
Thermostatic control

Air for combustion is brought in at the burner space only, thus avoiding excess air, and a weir overflow, with drain tap, is incorporated. The burner equipment comprises two 1-in. tubes, each fitted with 18 No. 266 size 2 Bray jets at 1¼ in. centres. Thermostatic control is provided.

Saving in gas consumption on the de-greasing and hot swill tanks has been very encouraging. Over a four-months' period, output was 43.5 production units per therm of gas used, compared with 23.3 units with the former equipment.

Components spend varying periods of time in the different tanks, the longest process being the bright nickel plating operation which occupies about 20 minutes and deposits metal to a thickness of 6/10ths. of a thou. The chromium deposition requires only about four minutes with about

An electrically-timed unit is used by Barking Brassware for brazing. In this case, the operator is brazing the screwed inlet shanks to sink mixer bodies, seen, after brazing, on the right.



A small gas-fired furnace is used for heating small brass 'billets' which are hot-pressed into such components as sink and bath wastes and backnuts. The operator removes the heated billet from the furnace with tongs and places them in the press. The operation is efficient and speedy, as many as 800 billets being stamped per man-hour in some cases.

12 millionths of an inch thickness of deposit.

A particularly interesting application of gas is found in heating the chrome tank, since few materials can withstand the attacks of chromic acid. The tanks themselves are protected with a lead lining and fitted with internal plate glass sheets to shield the electrodes.

Since a tank containing chromic acid cannot be heated directly, a system of indirect heating has to be employed in which the chromic acid tank is placed in another container of water which can be heated. Formerly, the water jacket was fitted with a 3 kW immersion tube and gas bar burners underneath.

North Thames Gas Board proposals for a new water jacket dispensed with both these forms of heating and substituted two 5-in. immersion tube gas-fired burners. Complete insulation of the water jacket base and sides was effected with Marinite insulation board which also provided insulation up to acid level round the sides of the chrome tank itself.

Heat loss

An intricate problem of heat loss arises from the acid tank which contains about 250 gal. of acid and leaves a considerable surface area exposed to the atmosphere. It is not practical to cover the tank with board or in any other way because components for chrome plating have to be inserted and removed continually.

Another point is concerned with loss of acid through the hydrogen bubbles produced in the action of electro-plating which brings a foam to the surface. The extract plant sucks away these vapours, removing a certain amount of acid in the process.

To minimise this loss of heat and acid, the surface of the tank can be covered with small sealed glass tubes, known as chromic acid floats, measuring 1½ in. by ⅜ in. diameter and weighing 5¼ lb. per thousand.

After leaving the chrome tank, the tap components undergo a soda rinse and cold water and hot water washes. They are then ready for final inspection and assembly.

Thus far consideration has only been given to the main body of the tap, but the final product includes many other components, some of which require to be chromium plated while others do not.

There are also such ancillary items as waste pipes, plugs and the like to be considered, and many of these components are produced by a hot pressing process, gas-fired furnaces being used to supply the necessary heat. For making sink or bath wastes or what are known as 'backnuts,' suitable sections of brass rod, described as 'blanks' or 'billets,' are first heated in a gas-fired furnace. The burner equipment is of the air blast type, with the flames playing into the open front of a refractory chamber and out at the back while the billets to be heated are placed on the hearth.

Convenient

This type of furnace, which at first sight appears wasteful, is in fact most convenient for the particular operation concerned. The operator has to remove the billets continually from the hearth with tongs and since the hot billet must be transferred as rapidly as possible to the press it would be quite impracticable to incorporate any type of door into the furnace. Cold billets also have to be fed into the furnace to maintain the supply of hot material.

Sited conveniently to the furnace, the press, which is capable of exerting pressures from 50 to 200 tons p.s.i., stamps billets into shape at the rate of 200 to 800 per man-hour, depending on the job.

It is also necessary to pre-heat the die of the press and this is effected by a separate circular aerated gas burner.

Electrically-timed

A number of operations during the assembly of the final products require the use of heat and gas is widely employed here also. Some fittings require brazing, for instance, and the equipment employed includes the Stanelco electrically-timed unit fitted with a series of standard Marshall burners using gas at town pressure and air at 10 lb. per sq. in. These give a finely adjusted flame playing directly on that portion of the fitting where the heat is required. This section also includes a number of hand blowpipes and torches operating on gas with air at ½ lb. per sq. in.

One of the best-known of all Barking Brassware products is the popular Biflo fitting, incorporating a single semi-circular tube designed to blend hot and cold water to the required temperature, as desired by the individual user. The principle of the Biflo is that hot and cold water (in the proportions desired and regulated by turning hot and cold taps in the normal way) passes along a channel joining the two taps into a central swivel nozzle. This comprises two tubes, one inside the other, leaving a space for the cold water to flow between the inner and outer tube while hot water runs through the centre tube.

Impossible

Hot and cold water therefore mixes immediately on leaving the spout, while it is impossible for hot water to flow back and enter the cold water mains.

Brass tube for both the inner and outer sections of these nozzles have to be annealed before bending into the desired shape, and this is effectively done, using gas in conjunction with an ingenious and extremely effective automatic device designed and manufactured by Barking Brassware's own engineers.

An automatic loader, extremely simple in operation, receives brass tubes cut to suitable lengths and a timing device lifts one tube at a time

on to a refractory hearth, heated by high pressure gas burners playing downwards. Through the operation of the timing device, the tube remains in the flame long enough to bring it to the temperature desired (700°C.), when it is automatically ejected and replaced by another.

This method enables continuous annealing to take place at the rate of one tube per 30 seconds, the only manual operation being the loading of the tubes into the hopper and their removal after annealing.

Gas is fed to the equipment at 4 lb. per sq. in. by means of a Keith Blackman No. 0 gas compressor. There is also a low pressure cut-off switch to cut out the compressor motor should the inlet gas pressure fall to or below 1-in. w.g.

Out of the ordinary

It would be expected that a firm specialising in the manufacture of water fittings would provide something out of the ordinary in the way of water fittings for its own staff. In fact, some 48 washing points have been provided virtually at the point of production, using a specially designed hot water tap with spray cap at the discharge nozzle.

Hot water for this system is provided from a Kayenco S.99 gas-fired boiler in conjunction with one 150-gal. cylinder which has replaced the previous installation of two cylinders of 150 and 120 gal. capacity respectively, each fitted with a 3 kW immersion heater.

Under the original scheme, it was proposed to provide a number of thermostatically-controlled blending valves to feed the various groups of troughs and basins. The use of the specially-designed single hot water tap per basin, however, controlled by a boilerstat at 105°F., resulted in considerable savings through dispensing with the separate cold water supply, blending valves and other fittings.

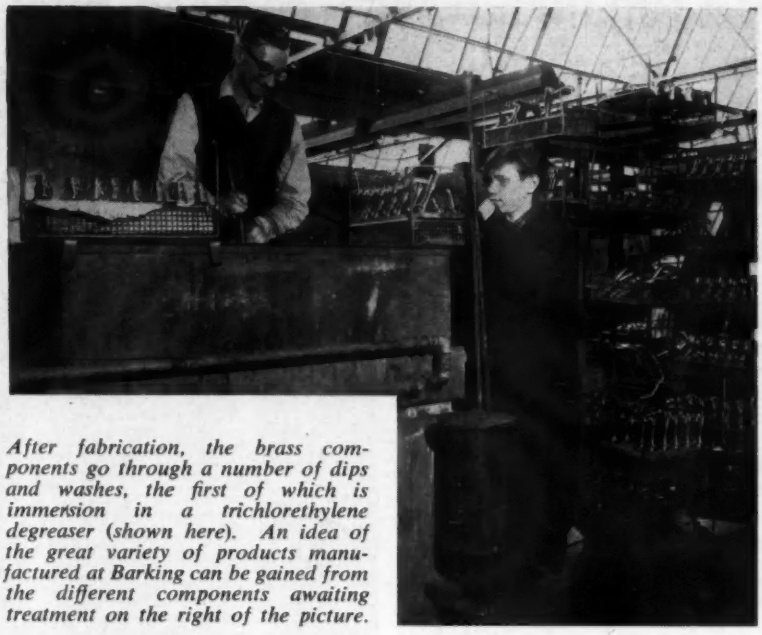
This system has proved so effective in operation that the hot water tap, designed originally for the firm's own use, has now gone into the catalogue and it should undoubtedly find many useful applications in other industrial premises.

Staff welfare

Like all progressive firms, Barking Brassware Co. Ltd., pay special attention to staff welfare by the provision of good canteen facilities and the heating of all premises as required. Gas is used for both these facilities, all the kitchen equipment being gas-fired.

Heating in the office block is by an Ideal central heating boiler, fitted with clock control and accelerator pump, while the remainder of the premises employ various types of high temperature overhead radiant heaters, some of which are on thermostatic control.

It is perhaps worthy of note that even the foundry requires space heating, which may come as a surprise to those who regard all foundry shops as places of unrelieved toil and sweat!



After fabrication, the brass components go through a number of dips and washes, the first of which is immersion in a trichlorethylene degreaser (shown here). An idea of the great variety of products manufactured at Barking can be gained from the different components awaiting treatment on the right of the picture.

Enterprising

Barking Brassware Co. Ltd., can thus be regarded as an enterprising firm which realises to the full the value of gas in its many-sided operations. The firm's General Manager, Mr. G. F. Moore, has clearly directed much careful thought and considerable energy to the development of the present efficient production process and that he should have relied so extensively on gas in operations where heating plays such an important part testifies to the virtues of this form of industrial heating.

Expanded sales

In recent years, the company has considerably expanded its sales and capacity is being increased to meet the rising demand for its products. This will undoubtedly bring increasing demands for gas and the North Thames Gas Board, which is proud of the part it has played in meeting the demands of the company in the past, is convinced that it can continue to do so in the future.

A gas-fired tool hardening furnace with preheat chamber in the tool room at Barking Brassware.

£100,000 works canteen has gas equipment

SERVERIES AND KITCHEN INSTALLED BY BENHAMS

ONE of the finest works canteens in Britain is the recently-opened Liardet Hall of Simms Motor Units Ltd., Oak Lane, East Finchley.

This building, which cost £100,000, covers 15,000 sq. ft. on two floors, comprising on the ground floor the main entrance hall and staircase, two staff dining rooms, games rooms, social club secretary's office and personnel department.

The second floor provides the main dining hall and theatre with professionally wired stage. Adjoining this extensive hall are the kitchen and food preparation rooms.

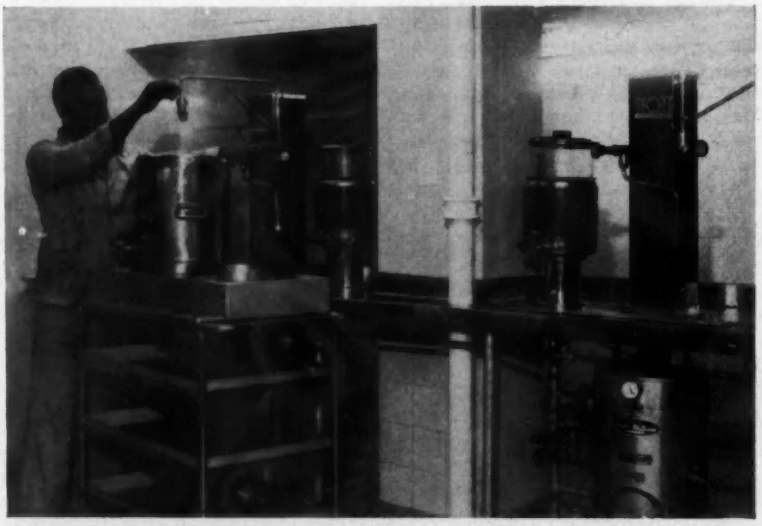
The kitchen and serveries in Liardet Hall were installed by Benham & Sons Ltd., and planned by them in consultation with the architect, Mr. S. Abel, and the Catering Manager of Simms Motor Units, Mr. G. W. Francis of Bateman's Catering Organisation Ltd. The builders were Hale Construction Company.

The kitchen, which can cater for approximately 500 meals in one sitting, contains the most modern equipment, and is planned to facilitate speedy hygienic service and convenient operation of each piece of cooking equipment.

The equipment comprises a stainless steel topped 42 ft. long service counter, with cold and hot sections, tea and coffee apparatus, and full length stainless steel tray slide, which is designed to fit in with the simple but effective decor of the main dining hall. Also supplied and manufactured by Benham & Sons Ltd., was the central pattern four-unit solid-top gas range with full width bain marie on one end and Mark IIIB grill in pot rack above.

Benhams also supplied, and (except where otherwise stated) manufactured, the following equipment: One Merton gas range, two steam-heated boiling pans, one gas-heated bain marie, one gas pressure steamer, one two-unit gas deep fat fryer, one steam-heated cabinet hot closet, 6 ft. by 2 ft. by 5 ft. high, one steam-heated hot closet, 4 ft. long by 1 ft. 6 in. wide, one boiling table 2 ft. 8 in. by 2 ft. 4 in., front service counter 42 ft. long, tea and coffee set (Stills), steam-heated, one Model No. 3 Splendid Deluxe dishwasher, one Model R.C.2 Peerless potato peeler, one Model SE. 302 mixing machine (Hobart), service counter, C.D. Junior Splendid steam dishwasher, one Model H3 hand-operated slicer (Asco), Hyco roll cutter, and urn washing unit (Bartletts).

The smaller staff servery downstairs is supplied with food in service containers by means of two service lifts, and has the usual service-type hot closets with bain marie wells for food service containers, and glass sneeze plate with stainless steel shelf over.



At the new Knightsbridge, London, offices of the National Benzole Co. Ltd., Stotts of Oldham supplied the cafeteria service counter and tea-making station equipment for the fine kitchen and servery which has been installed. The tea-making equipment, shown in the picture, comprises gas-heated Connoisseur pressure boilers fitted with swivel taps for feeding the tea-infusing urns, and also separate milk-warming urns.

FACTORY KITCHEN EQUIPMENT

At its showrooms in the Market Hall, Leeds, the North Eastern Gas Board held an exhibition of kitchen equipment suitable for small canteens and factory kitchens, including the latest type of barbecue oven, suitable for cooking chickens and large joints.

Film storage posed heating problem for gas board

SCREEN advertising agents Pearl & Dean Ltd., have office and warehouse premises in Rainsford Road, London, N.W.10, where films are transported by conveyor belt for sorting and examination by seated operators and are then stored.

When the heating system for these buildings was being reviewed, the North Thames Gas Board's Central Services Section arranged for a gas-fired No. 1 Series, three-section Rex boiler to be installed in place of a solid-fuel boiler for the heating of the offices. The heating of the warehouse building presented problems due to the large stock of films stored there. It was decided to use warm air heating and three Harris 1408 gas-fired heaters have been installed, as shown in the illustrations.

The best safeguard against the danger of air-blast being forced back into the gas supply line.

- They have no mechanical hinge
- They do not stick in action
- They do not affect gas pressure
- They are available for either horizontal or vertical use

Standard sizes, 1 in. to 6 in., screwed or flanged. Larger sizes made specially.

CHARLES WINN & CO. LTD.

GRANVILLE STREET · BIRMINGHAM 1.

Valves and fittings for gases, water, steam, air, oil and chemical fluids.

WINN CENTENARY 1859 1959

VALVE MAKERS FOR 100 YEARS

Gunite

One of the reinforced concrete structures reconditioned with Gunite at the Carlisle Works of the Northern Gas Board

Gunite—concrete applied by air pressure—has numerous applications where its great density and extreme adhesion have exceptional value.

For repairing reinforced concrete it has particular merit, as, due to the method of application, a uniform density and adherence is obtained whenever Gunite is applied.

For lining coal bunkers and steel chimneys it possesses great resistance to corrosion and protects steel-work from the abrasive action of coal or coke.

116, RICHMOND ROAD, KINGSTON-UPON-THAMES, SURREY
KINGSTON 7883 & 9252

10, ROYAL CRESCENT, GLASGOW C.3
Telephone: GLASGOW DOUGLAS 8671

THE CONCRETE PROOFING CO., LTD.

Handbook "GUNITE" sent on request

W. H. SISMEY *and Company Limited*

POWELL STREET
HALIFAX
HALIFAX 3314

Co-operate

with

SISMEY & LINFORTH *Limited*

ALCESTER ROAD SOUTH
BIRMINGHAM 14
HIGHBURY 1369

for all types of

town gas fired
FURNACES

By kind permission
Messrs. Reynolds T.I. Aluminium Co. Ltd.

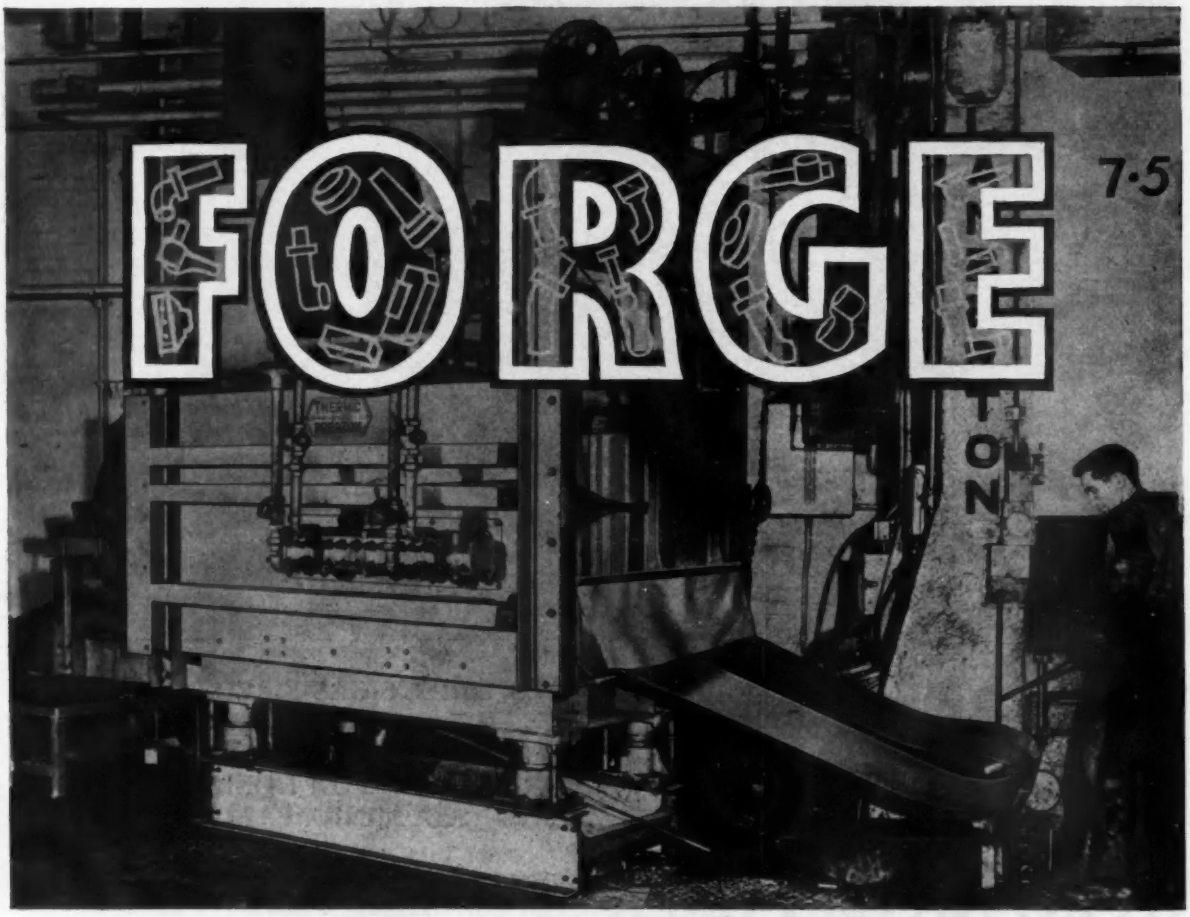
TWO DIRECT GAS-FIRED CONVECTION TYPE FURNACES WITH HIGH SPEED RECIRCULATING FANS FOR HOMOGENISING ALUMINIUM BILLETS

GIBBONS

GIBBONS BROTHERS LTD

P.O. BOX 19 · DIBDALE · DUDLEY · WORCS.
Telegrams: "GIBBONS, DUDLEY". Telephone: DUDLEY 55141 (P.B.X)

THERMIC
Mechanised



(Photograph by kind permission of The Austin Motor Co. Ltd.)

FURNACES

A wide range of standard or tailor-made mechanised forge furnaces is available, Pusher Type – Rotary Hearth Type – Conveyorised Bar End Heating, with GGC scale-free heating system or fired by Standard Town Gas.
The Photograph above illustrates a small Thermic Magazine Feed Pusher furnace fired by CC Burners. Output: 7-cwts. of small billets per hour.

Thermic Equipment & Engineering Co. Ltd.,
(Subsidiary Company of Gibbons Bros. Limited, Dudley)

SALMON STREET, PRESTON *TELEPHONE: PRESTON 56254/5.* *TELEGRAMS: THERMIC-PRESTON*

Printed by STRAKER BROTHERS LTD., E.C.2, for WALTER KING LTD., 11 BOLT COURT, FLEET ST., LONDON, E.C.4., Wed., June 10, 1959

you can't drop a spanner in the works

with this flooring

SAFETREAD

WELDED STEEL FLOORING

Engineers everywhere are aware of the unique design and construction of 'Safetread' flooring—its construction has gained universal appeal as it provides the greatest possible strength and rigidity with a minimum use of steel, thus enabling valuable economies to be effected in supporting members.

With Safetread's welded construction, nothing can work loose or cause chattering through vibration—its design enables maximum light and air penetration and yet the danger of tools or other similar objects falling through is reduced to an absolute minimum.

Write today for a catalogue of Safetread "tailor-made" flooring—amply illustrated, it contains deflection tables, safe-load tables, and a wealth of useful information for the man with a flooring problem.

ALLAN KENNEDY & CO · LTD

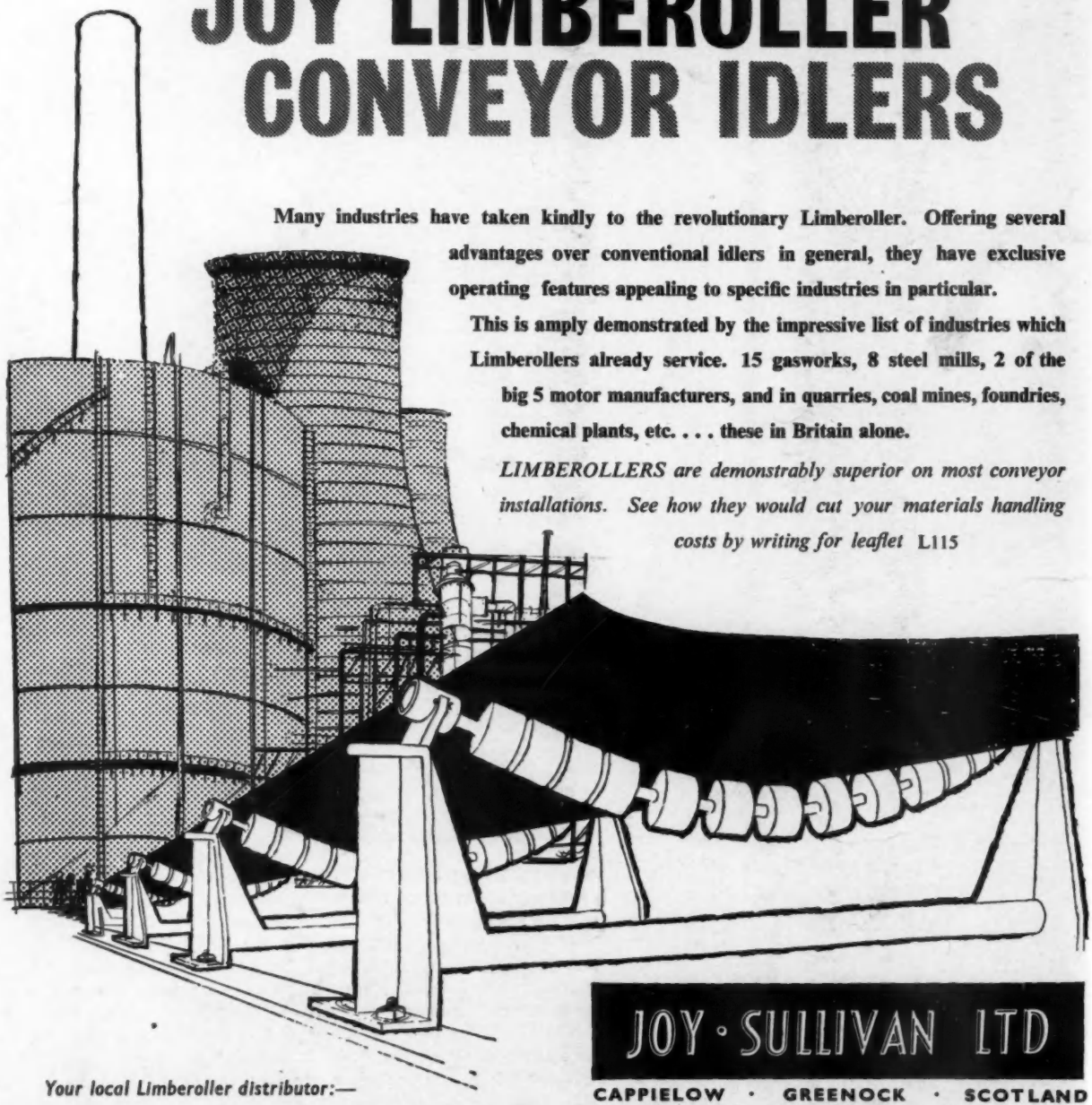
MARITIME STREET · STOCKTON-ON-TEES

Telephones: STOCKTON 65464 (4 lines) · Grams: 'GRATING' STOCKTON-ON-TEES

London Office: ABFORD HOUSE WILTON ROAD LONDON S.W.1 · Tel: VICtoria 2539

P2678

EUROPE'S BIGGEST GASWORKS SPECIFY JOY LIMBEROLLER CONVEYOR IDLERS



Many industries have taken kindly to the revolutionary Limberoller. Offering several advantages over conventional idlers in general, they have exclusive operating features appealing to specific industries in particular.

This is amply demonstrated by the impressive list of industries which Limberollers already service. 15 gasworks, 8 steel mills, 2 of the big 5 motor manufacturers, and in quarries, coal mines, foundries, chemical plants, etc. . . . these in Britain alone.

LIMBEROLLERS are demonstrably superior on most conveyor installations. See how they would cut your materials handling costs by writing for leaflet L115

JOY · SULLIVAN LTD

CAPPIELOW · GREENOCK · SCOTLAND

Export Sales : 7 Harley Street, London, W.1.

Your local Limberoller distributor:—

SCOTTISH
Potter & Cowan & Co. Ltd.,
54 French Street, Glasgow, S.E.2. *Tel: Bridgeton 3791*

NORTHERN
Hill Porter (Newcastle) Ltd.,
6 Pit Yard, Wallsend-on Tyne. *Tel : 64102*

NORTH EASTERN
Glover & Wood Ltd.,
Victoria Works, Victoria Road, Leeds, 11. *Tel: 31157*

NORTH WESTERN
Atlantic Rubber Co. Ltd.,
Atlantic Street, Broadheath, Altrincham, Cheshire.
Tel: Altrincham 3727

MIDLAND
Central Manufacturing & Trading Co. (Dudley) Ltd.,
Halesowen Road, Old Hill, Staffs.
Tel: Cradley Heath 69434

SOUTH WESTERN
M.Q.C. Equipment,
Chesterfield Chambers, Westbourne Place, Bristol, 8. *Tel : 39405*

SOUTH EASTERN
Southern Industrial Rubber Ltd.,
1 High St., South Norwood, London, S.E.25.
Tel: Livingstone 5568